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Some North American Botanists.

I. C. S. Rafinesque.

No name connected with American botany suggests greater possible success and more dismal actual failure than that of Constantine S. Rafinesque-Schmaltz. His ambition was his destruction, for it seemed to consist in establishing new genera and species and this he pursued so persistently that in his later years it became a monomania. His earlier writings contain real contributions to botanical science, but his later are simply collections of absurdities which if recognized at all would so cumber our synonymy that it would tend to make of it a hopeless tangle. And so this botanist of real genius, who boasted of having established over three thousand new genera and species, has his name attached to but a paltry dozen of genera in Gray's Manual, which covers nearly all the ground of his personal explorations. In his voluminous and scattered writings hundreds of pages must be read to find one which contains anything of value. Rafinesque should be held up before the young botanist of to-day as the type of a species-maker run mad, whose tendency was to so magnify every slightest deviation from the type that to him it meant a new genus or species. This statement finds it culmination in the paper which he sent to a well known scientific journal, in which he described in regular natural history style *twelve new species of thunder and lightning.*

The subject of this sketch was a Sicilian and first came to this country in 1802, remaining for three years, engaged in exploring our Atlantic slope, travelling on foot over much of the territory between Northern Pennsylvania and Virginia. In 1815 he returned from Europe and remained until his death, which occurred in September, 1840. During these 25 years he explored most indefatiguably from Vermont to Virginia and westward to the Wabash River. In 1819 he was appointed Professor of Natural Sciences in the University of Lexington, Kentucky, where he remained for seven years. In this time he claims to have explored that state thoroughly and made excursions into neighboring states north and south. During his last years he was engaged chiefly in exploring southern New Jersey and the pine-barrens.

Rafinesque has published quite an interesting autobiography, entitled, *A Life of Travels and Researches*, which contains much that is interesting, giving an account of his travels and well describing the discomforts and pleasures of the botanical explorer. The following extract from the introduction to his *New Flora of North America* will convince all of our collectors that the writer knows what he is talking about.

"Musquitoes and fleas will often annoy you or suck your blood if you stop or leave a hurried step. Gnats dance before the eyes, and often fall in unless you shut them; insects creep on you and into your ears. Ants crawl on you whenever you rest on the ground; wasps will assail you like furies if you touch their nests. But ticks, the worst of all, are unavoidable whenever you go among bushes, and stick to you in crowds, filling your skin with pimples and sores. Spiders, gallineps, horse-fles, and other obnoxious insects, will often beset you or sorely hurt you."

It is needless to say that the other side of the picture is also presented, and the pleasurable excitements of discovering "new things" well drawn.

It is difficult to enumerate the writings of Rafinesque, for they are so scattered throughout transient publications, that it is hard to know when all are counted and just as hard to find all that are known. In the *Am. Jour. Sci.*, Vol. 40, No. 2, 1841, is an article entitled, "Notice of the Botanical Writings of the late C. S. Rafinesque," written by Dr. Gray, and the acknowledgement might as well be made here that to it we are indebted for most of the information contained in this sketch. In the article referred to, Dr. Gray makes mention of nearly thirty titles which relate to botany, most of them however meaning not books but pamphlets.

Something now as to Rafinesque's methods in establishing new genera (which by the way he called genuses) and species. Those which he established upon personal observation are entitled to the most authority, but faulty partly on account of an ignorance of previous writings, but mostly because the slightest deviation in leaves made species and any change in floral organs led to the establishment of genera. His writings showed an appreciation of natural affinities and of the advantages of a natural classification, but the boundaries of a species or genus lay in an unknown region. He insisted that new species and genera are being constantly produced by the deviation of existing forms, which at length give rise to new species, and finally to new genera. This view was certainly in advance of his age and does great credit to his powers of observation. But he absurdly gave estimates as to the time in which these changes were made, stating that from thirty to one hundred years was the average time required for the production of a new species, and five hundred to a thousand years the time required for a new genus. Hence he thought that the business of establishing new genera and species would be endless, but he set himself manfully to work in his *Flora Telluriana* to establish 1000 totally new genera.

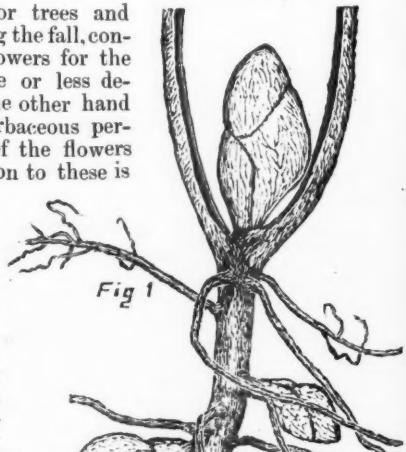
While a certain amount of patience can be retained in sifting his work upon forms which he himself saw and studied, this cannot be said with reference to his other work, for he had the pernicious habit of establishing genera and species upon descriptions and very imperfect descriptions too, of forms which he had never seen. For instance, his *Florula Ludoviciana* contains the descriptions of 30 new genera and 196 new species, not one of which had he ever seen, not one of which had even been collected, and all based upon the imperfect descriptions of a Mr. Robin, a man who did not know a *Ranunculus* from a *Polygonum*. The amusing part of it is that Rafinesque accepts Robin's identifications when there is no description, but whenever a few words of description are appended, the plant cannot be what Mr. Robin called it, cannot be anything before described, and hence must be a new genus or species. Thus he went to work upon the various writings of such botanists as Pursh, Nuttall, Elliott, Torrey, etc., and whenever they expressed any doubt as to the relationship of a certain form, a new species or genus would be established. Dr. Torrey's account of the plants collected by Dr. James, in Long's Expedition, yielded to the fertile imagination of Rafinesque 20 new genera! Dr. Gray mentions one instance he happened to know about, where our botanist mistook an undeveloped *Bupleurum* for a grass, and described it as a new genus of *Gramineæ*. Being told of his mistake he published it as a new genus "near to Bupleurum." He furnishes probably the only instance of a botanist persistently desiring to dedicate a genus to himself. The genus proposed just as persistently refused to stand and in despair he provides half a dozen Rafinesquias, from which botanists may take their choice. I know not whether his desire in this particular has ever been gratified. In the *Flora Telluriana* he begins in earnest the business of making genera, proposing, as has been said, to establish 1000 new genera. To give the cases referred to in the *Am. Jour. Sci.*: "*Allium* was divided into 15 genera; *Solidago* into 7, with about twice as many sub-genera; *Saxifraga* into 12 genera, which are placed in three natural orders, and two different classes; *Polygonum* into 23; *Gentiana* into 14; *Linum* into 34; *Hypericum* into 11; and *Salvia* into 14 genera absolutely, and 14 more proposed as doubtful or perhaps sub-genera." Of this whole regiment of genera marched to the front to stand the fire of criticism but 12, a corporal's guard, survive in the region covered by Gray's Manual, viz: *Adlumia*, *Polanisia*, *Cladrastis*, *Osmorrhiza*, *Lepachys*, *Erechthites*, *Ilysanthes*, *Blephilia*, *Peltandra*, *Clintonia*, *Diarrhena*, and *Eatonia*, and Bentham and Hooker have slain some of these. The fact is that Rafinesque's work is so unreliable that he has not even received the credit that he deserves, and some of his names ought to have been retained that were disregarded. Never was there a finer field open to the enterprising botanist than this country presented to Rafinesque when he landed here in 1802. No one made any

pretensions to such knowledge or ability as he possessed and the land was his "to enter in and possess." When he returned in 1815 the land was already partly possessed for Pursh, Nuttall, Elliott, Bigelow, etc., were at work. When we come to analyze the character of this eccentric man it seems as though the secret of all his eccentricity and cause of his failure to reach the rank for which nature had fitted him, was an unbounded egotism. Then, as now, there occasionally appeared one who preferred self to truth, even in communion with nature, who is the very embodiment of truth and is supposed to cultivate a love for it in her votaries. But the fact is scientific men are dreadful egotists and their own opinion is often worth a good deal more to them than the truth, and our estimate of Rafinesque is that he was simply an extreme and outspoken representative of a large class of scientific men to-day. And so he was ever working, but rarely accomplishing anything; always eager to publish, but his writings the rarest of all; anxious for his name to be remembered, but so using his talents as almost to bury himself and his works in a too harsh condemnation.

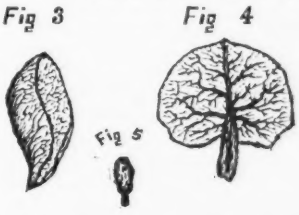
"Effort for self ends aimlessly;
Effort for truth grows endlessly."

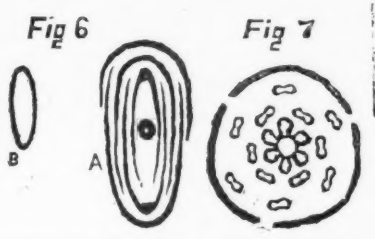
The Hibernaculum of Asarum Canadense, L.

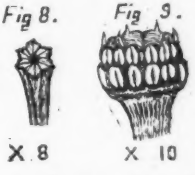
It is quite common for trees and shrubs to form buds during the fall, containing the leaves and flowers for the following year in a more or less developed condition. On the other hand it is very rare among herbaceous perennials to find any trace of the flowers until spring. An exception to these is our common Wild Ginger. On the 25th of November, I noticed in the garden of Mr. W. Werthner, that the creeping rootstocks had formed very flat buds which laid horizontally on the ground or were slightly covered by soil (Fig 1 and 6 B). He kindly permitted me to take the specimens. On the side of the bud towards the end of the shoot will be found a small ovate-oblong scale (Fig. 2). Follow-



ing this scale in alternating order will be found two more of the shape indicated in Fig. 3. All three scales are visible on any bud without dissection (Fig. 1). Within these are two leaves (Fig. 4) and in the center the flower bud (Fig. 5). The general arrangement of the parts can be seen in Fig. 6 A. The style (Fig. 8) is already quite well developed, the lobes and furrows being distinctly shown and the stamens (Fig. 9) contain the rudimentary pollen of the next year. The arrangement of the parts of the flower may be seen in Fig. 7. The buds are easily attainable in spring and it seems to me could be profitably used in the class room in comparison with the hibernacula of ligneous plants.—AUG. F. FOERSTE, *Dayton, Ohio.*







The Lignified Snake from Brazil.

It will be remembered that in the December GAZETTE a brief notice was given of what was described as being a lignified reptile. A tolerably full account of this phenomenon was given in the *Popular Science Monthly* and *Torrey Bulletin* for November, the account being the reproduction of one published in the French *La Nature* of last April. This account comes with all the authority of M. Olivier and the Botanical Society of France. It seems that the piece of wood containing the specimen is the property of Senor Lopez Netto, Brazilian Minister to the United States, who first took it to France but has it now in this country. After running the gauntlet of the scientists of Rio de Janeiro and the Botanical Society of France it has remained for our keen-sighted and quick-witted veteran botanist, Dr. Gray, to call in question its genuineness. Alas for the phenonenon that is not sure of its foundations when Dr. Gray lays his heavy hand upon it! Hear what he has to say about this latest "snake story":

"[1]Through the kindness of the Brazilian Minister, we have seen

[1] Am. Jour. Sci. Jan. 1883, p. 81.

and examined the original specimen, and have been presented with an electrotype of it. It is a great curiosity. The resemblance to a snake is wonderfully close, although "the scales and cephalic plates," which M. Olivier identifies with those of a particular Brazilian snake, exist only in a lively imagination. The snake-like surface is covered by delicate meshes of woody fibers; and here and there particular fibers or woody threads can be traced from the body to the woody surface.

The adopted explanation requires us to suppose that a snake had forced his way between the bark and wood of a living tree in a position exactly under a grub or larva; had perished there when within half an inch of its prey; was somehow preserved from decay, even to the eye-sockets and markings of the skin, until a woody growth had formed, the elements of which replaced the whole superficial structure of the animal,—until the animal was lignified! Two other and more probable explanations have suggested themselves. One is, that the snake-like body is of the nature of a root, an aerial root, like those of a *Clusia* or a *Ficus*, which was making its way between bark and wood; and that the supposed larva is an incipient root of the same kind. The other supposes that the sinuous course is the track of a wood-eating larva or some kind of insect, the burrowing of which had not destroyed the overlying liber: consequently the new growth filling the space (except at certain points) had naturally assumed the likeness of a snake. This explanation was suggested by Professor Wadsworth of Cambridge, examining the specimen along with the writer; and it is to be preferred. Still, that head and neck should be so well outlined, and the former so well represent a pair of orbits, were surely most wonderful. But a close inspection of the electrotype showed that there had been some cutting away at the right side of the neck, and that the narrowing there was in part factitious; and less decisive indications suggested that other outlines had been touched up. The subsequent inspection of the original confirmed this; and likewise enlightened us about the eyes. For the left orbit was found to occur, not in a woody structure, like that of the right side, but in a dark material having the appearance of pitch or cement of some sort.

We may rest assured that whatever there may be which is factitous in this most curious *lusus naturæ*, originated before it came into the hands of His Excellency the Brazilian Minister at Washington."

Epiphegus Virginiana.

(PLATE I.)

This little plant being somewhat remarkable in its peculiar way of living, we thought it might not be amiss to follow it in its career from infancy, on through its struggle for existence, to the maturity of its fruit, after which, when thousands of little seeds

are scattered, and having faithfully performed its allotted portion of duty, it quietly retires to rest.

The plant lives but a short time, perhaps not more than a month passing between germination and maturity. During this short time we must complete our investigations or remain as before in darkness as to how it came, how it grew and where it obtained its nourishment.

It has no true roots and does not contain chlorophyll, it therefore must be either parasite or saprophyte. It cannot live where there are no assimilating plants, this would indicate it being a parasite, which indeed it is, but a curious one. Having apparently no haustoria, the question arises, how then does it live? We know that this is a parasite. We know also that it lives extracting, or shall we say receiving nourishment from the beech, and from that alone. Sever its connection with the beech, that is, cut the beech root, on which it grows, carefully as you please, without disturbing the plant itself in the least, it will die; but dig it up, break off all its root-like appendages, but do not cut off the beech root, plant it again and it will live, grow, and ripen its seed. We say it is a parasite on the beech. How? We shall see. Here is a small plant not more than two inches high, less than one-fifth of the full size, growing among some half decayed leaves, or as frequently in soil where there is little or no vegetation but itself and the beech; we dig it up, carefully divest it of its coating of dirt, and we have something like Fig. 1, the lower part of the plant swelled out into a sort of bulb, and from this bulb protruding in all directions, a number of ramifications, in appearance, not unlike the horns of a deer, which for want of a better name we will call grapplers; these might be mistaken for roots but they are not, their use being to hold the plant firmly in the ground: this is probably all we will see, the beech-root having been broken off. To show that this is true, we cut several vertical slices from the bottom of the bulb, and place them under the microscope, somewhere on one of them will be seen (Fig. 2) a cluster of large cells, surrounded by a band of tissue, much finer, and of two different kinds, in which we find a cell formation closely resembling that of the beech, and not to be found in the upper parts of the parasite. (If the plant possess anything analogous to haustoria, it will probably be found in connection with the inner part of this band.)

We now select a larger plant, and find it attached to a larger root, perhaps a sixteenth of an inch in diameter, or more. The parasite has a tight hold with its grapplers, bending them over the root as if to hold it in position, this, however, being not always the case. We break the grapplers away, and find the bulb adhering to the side of the root as if glued; a thin slice and a microscope shows (Fig. 3) the beech root at B, and a portion of the parasite, C, looking very much as though the beech had reversed the order of things, and had grown into the parasite. But now we go further, and in the

same way examine another (Fig. 4); here the parasite is larger and requires more nourishment, consequently the root has changed its course, all the descending fluids passing into the parasite, while that portion beyond the parasite has dwindled down to less than half its former size; later it decays and falls away, leaving the whole root to the parasite, which is so well supplied that its cells always contain quantities of starch, while there is so much tannin in its juice, that a very good ink may be made by simply adding to it a small quantity of copperas, or sulphate of iron.—S. T. FERGUS, *West Chester, Pa.*

EXPLANATION OF PLATE I.—Fig 1. A young plant; the beech root was attached at A.

Figure 2. A vertical section from the lower part of Fig. 1. A, the point at which the beech root was attached.

Figure 3. Section through beech root, B, and parasite, C. The beech root healthy throughout.

Figure 4. Section through beech root, B, and parasite, C. The beech root at B in a dying condition.

Kentucky Fungi.

A sojourn of a couple of weeks at Norwood near Somerset, Pulaski Co., Kentucky, gave us thirty figures of fleshy or putrescent Fungi and upwards of fifty species of the more durable kinds, all new to our herbarium. We think we have five or six new species but these must remain awhile in the stocks to be well considered before being launched forth upon their independent being. New species of *Lactarii* are easy enough to find and Mr. Berkeley asserts that "the warmer states of North America abound with Lactarii quite different from the European species" but no one need expect to disentangle them unless he persistently *figures* and studies all the different forms he meets with. The same remarks apply to the *Boleti*.

It is not my purpose to catalogue everything observed, but merely to notice some of the more interesting species.

AGARICUS PALYPYRAMIS, *B. & C.* This is a large, coarse, heavy Amanita, the pileus studded with thick warts and the stipe rooting 3 or 4 inches into the ground. I find the spores subelliptic, with a slight oblique apiculus and measuring .009×.007 mm.

AGARICUS LEAIANUS, *Berk.* This beautiful Mycena of the Cincinnati Catalogue, seems to be abundant everywhere east of the Mississippi. Its spores measure .0090×.0056 mm.

AGARICUS FENZLII, *Schulz.*, var. My specimen is this species except the stipe in not "sulphureo." Annularias are extremely scarce everywhere. I have never known of any except A. lævis, Krombh., being found in North America before.

CORTINARIUS SQUAMULOSUS, *Peck.*, ranges from New England down here unchanged.

RUSSULA VIRESCENS, *Schaeff.* A new species to us and furnishes a beautiful figure.

LACTARIUS INDIGO, *Schw.* This is deep blue within and with-

out and exudes a blue juice. The spores are ochraceous, a little oblique and .007 mm. long.

LACTARIUS ICHORATUS, *Botsch.* This species, I believe, is new to the record in this country. We added six new figures of Lactarii to our collection.

BOLETUS PURPUREUS. *Fr.* All the Boleti furnish gorgeous paintings. This one is a brilliant red with white flesh changing to blue.

BOLETUS ———near *Russellii*, Frost, but the spores are something enormous, measuring .018×.009 mm. It is awaiting Prof. Chas. H. Peck's determination.

BOLETUS RETIPES, *B. & C.* Mr. Berkeley would have better said *puberulent* than "pulverulent" in his description. I found no specimens with gray or brown pilei, so am disposed to consider *B. ornatipes*, Peck, a good species; nevertheless the two are very closely related. The spores are bright yellow, the same as the flesh. I give .011×.0056 mm. for their measurement.

FISTULINA HEPATICA, *Huds.*, might be found growing at the base of nearly every chestnut tree; the specimens were often perfectly magnificent. Dodham says "No fungus yields a richer gravy, and though rather tough, when grilled it is scarcely to be distinguished from broiled meat." We, however, would express a decided preference for Mrs. Lewis' broiled chicken.

HYDNUM. The species of this genus were very numerous; here is the list of conspicuous ones:

H. imbricatum, Linn.
diffractum, Berk.
infundibulum, Sw.
velutinum, Fr.
zonatum, Botsch.
adustum, Schw.
coralloides, Scop.
H. repandum, Linn.
suaveolens, Scop.
aurantiacum, A. & S.
cirrhatum, Pers.
glabrescens, B. & Rav.
flabelliforme, Berk.

The specimens of most of these were very fine indeed; I never before saw such large *H. repandum*, Linn. A figure of one lies before me; the pileus measures 5½ in. across, the stipe is 3 in. long and 1½ in. thick. They evidently grow much finer down south.

CLAVARIA. Species of this genus were numerous; among them *C. rufescens*, Schaeff, with its rosy tips. *C. formosa*, Pers., I here saw for the first time.

SCLERODERMA GEASTER, *Fr.* We thought we had some new and singular Geaster; but a view of the large fluffy spores under the microscope immediately revealed a *Scleroderma*.—A. P. MORGAN, *Cincinnati, O.*

Notes from Franconia.

To a botanist who has to teach all the winter, the summer vacation offers especial charms. He plans out in the previous winter how and where he shall spend it, and furbishes up his armor and appurtences in the shape of *vasculum* and portfolio. My last summer

was spent in two very distinct regions, the Highlands of the Hudson, and the Franconia Valley of New Hampshire. At West Point I collected for about ten days and under the guidance of Mr. Edward S. Denton, visited some excellent localities. My friend showed me his corner for *Camptosorus rhizophyllus*, a wild nook on a mountain side amidst a confusion of boulders, and densely shaded with forest growth. Here in a perfect tangle of ferns we refreshed the inner man preparatory to a further jaunt. A mile's walk took us to the opening of the famed "ravine" on Crow's Nest, which, however, we did not ascend. As I have been familiar with it from childhood, I will say that it is one of the richest spots for collecting in that whole interesting region. In one scramble up the steep sides of the cascade, I have often found in May, *Sanguinaria Canadensis*, *Orchis spectabilis*, *Cypripedium pubescens*, *Asarum Canadense*, *Menispermum*, *Mitella diphylla*, *Allium tricoccum* and many other beauties. My father made a thorough study of this mountain, and his old copy of Bigelow, which I possess, is enriched with many notes and drawings of the plants there found. I saw at West Point this summer on the cliffs near the river, solid beds of *Opuntia* in full flower. Nothing could surpass the loveliness of their lemon-yellow blossoms. I collected *Ptelea trifoliata* for the first time, and imagine that this is rather far north for it to grow. *Vincetoxicum nigrum* was abundant in several places. Mr. Denton intended showing me the tamarack swamp, were he has found some rare things, but heavy rains interfered with our plans.

I arrived in Franconia about the 6th of July, and at once began to collect in that famed region. It goes without saying that it is surprisingly unlike my field here in Rhode Island. The absence of many familiar deciduous trees at once impressed me. There were no chestnuts or oaks, for instance, nor do I remember seeing a single hickory. In place of these were birches of all kinds, the paper-birch being especially conspicuous; spruces without end, and tall white pines that had I not seen the coniferous forests of the Pacific slope would have quite astonished me by their size. Even at this late date I was in time to collect *Linnea borealis*, and all summer long the pretty *Oxalis Acetosella* made the woods gay with its pink bells. By following up the Copper Mine Brook to Bridal Veil Falls, I could secure these spring flowers in all states of progress, the elevation giving a wide range of climatal conditions. Later, the beds of *Moneses uniflora* were simply ravishing. I found also a few specimens of *Pyrola minor*. I checked off during the summer in an old Manual the plants seen and identified, and have many as yet unstudied. This list, which is much too long for publication in the GAZETTE, I sent to the *Appalachian Club*. I was within easy reach of the famous Flume, of Echo Lake, Kinsman's Flume, and Mount Lafayette. I have already sent you a note concerning my red-letter day up among the alpines on this old monarch. I only regret that I did not spend a week near the summit,

for nearly everything I secured was precious.

I have for some time been especially interested in mosses, and here I found myself in their chosen home. They cushioned the rocks and trees, and often hung over the treacherous holes between the cliffs, drooping in masses like snow from the eaves of a house. They were embarassing from their multitude. Any one mat that was dug up contained always a number of species interlaced. I shall have work for months in disentangling and naming them.

These few notes, I am aware, contain no information, but are given in hope that they may serve, perhaps, to call up to the minds of some a pleasant picture of two beautiful regions. I hope others of your readers may yet have an opportunity to dwell, as I did, for two months, among these magnificient mountains, and to contribute a little more knowledge of a flora so rich and fascinating.

—W. W. BAILEY, *Brown University.*

GENERAL NOTES.

Lactuca Scariola, L.—I collected *Lactuca Scariola, L.*, in Cleveland, Ohio, August 11, 1882.—R. S. HUBBARD.

Gentiana crinita.—In the November number of the GAZETTE, Mr. Davenport calls attention to albinism in *Gentiana crinita*. I have several times in former years seen cases of this. One superb plant which I found near Diamond Hill, R. I., about two years ago, had thirty or more blossoms, all pure white. I have this year had a white specimen sent me from near Providence. I should have noticed these before, had I not in one instance, been informed that cases of albinism were too trivial to report. If so good a botanist as Mr. Davenport considers them of consequence, I shall at least be in excellent company.—W. W. BAILEY, *Providence, R. I.*

Lactuca Scariola, L.—Mr. Foerste's suggestion, in the November No. of the GAZETTE, respecting the probability of this plant being naturalized in Wisconsin, had already been verified. In Aug. 1880, I met with it, well established, along a road side, in Mukwanago, about 40 miles west of Milwaukee. In August of last year, I found it growing in abundance along R. R. tracks and upon the banks of the Maumee River, in the City of Toledo, O., and, in October last, I again met with it, growing near the Cattle Yards, at East Buffalo. To all these places it had evidently "come to stay." Doubtless, however, it had reached E. Buffalo as an adventive from the West.—DAVID F. DAY, *Buffalo, N. Y.*

Ejection of the Seed in Cereus Emoryi, Engelm.—I have a plant of *Cereus Emoryi* which produced last summer three flowers at the apex of a previous year's stem. Not being familiar with the species, the

specimen received almost daily attention. One morning a stream of black seeds was found to have been ejected from the apex of an erect fruit, and had coursed down the sides and over the brown spiny surface like a stream of lava from the top of a burning mountain. The placentous mass ejected with the seeds, hardens soon after ejection, and holds the seeds in place. The other two seed-vessels behaved in the same way, but in order to note what else might occur to favor the distribution, the seeds have been left in the channels of the dry streams until to-day—two months. The process of expulsion and the precise objects to be gained by this method, must be left to further investigation.—THOMAS MEEHAN.

Alaska Ferns.—The following species are to be added to the list previously published in the GAZETTE (Vol. VII, p. 96.) and belong to the same collection made by Mr. Turner on the Island of Unalaska, in 1879–80 and 81. The sheets containing them having been placed in another part of the package were overlooked when preparing the first list for publication.

15. *Adiantum pedatum*, L. Specimens characteristic.

16. *Phegopteris polypodioides*, Fee. Specimens very pubescent and scaly along the rachises. Some of them more rigid than eastern specimens and with different aspect, but a close examination fails to reveal any real difference in character.

Still another sheet contained quite a number of specimens of *Polypodium vulgare* showing considerable variation.—GEO. E. DAVENPORT, *Medford, Mass.*

Sound of Discharging Ascospores.—In collecting *Peziza pubida* this summer, I happened to place a box-full in the sunshine, when they began discharging the spores with a distinct and very peculiar fizzing noise, somewhat like the noise of soda-water. I tried many specimens with the same result. I have found no other species that exhibit this phenomenon. In *Science Gossip* for December 1871, however, there is an article on *P. aurantia* from which I quote the following: " * * * I blew upon another, and found that about a second after I had blown upon it, it showered out, if I may so say, in all directions, chiefly around the edge. I did this repeatedly, and found that after they had been left five minutes or so, the same effect followed about a second after they had been blown upon;and what surprised me still more was, that several times, the "shower" in issuing forth *made a distinct sound*, which I cannnot better describe than as a slight fizz." My specimens, collected here, supposed to be *P. aurantia*, do not exhibit this peculiarity.—E. W. HOLWAY, *Decorah, Iowa.*

Marked Protandry.—In passing through the greenhouse last spring my attention was caught by the very marked protandry of the flowers of the Lemon-scented Pelargonium, *P. graveolens*, of the gardeners. On the large potted plant observed the flowers were in all stages of anthesis

and all the changes undergone by the stameus and style were clearly shown. The stamens are of very unequal lengths,the three superior ones(1, 2, 1, Fig.)being the shortest and united by their filaments. The two inferior (4, 4, Fig.) are longest and the remaining ones (3, 3, Fig.) intermediate in length. Two of the missing stamens are represented by sterile filaments but there is no trace of the inferior one (?, Fig.). While the anthers are bursting the five stigmatic surfaces are closely pressed together. So perfect is the protandry that the anthers shrivel and drop off and the filaments wither and curl up before the stigmas are exposed. In rare instances one or two shriveled anthers persist until the style begins to open.—C. R. B.

Diagram of flower of *Pelargonium graveolens*. Stamens numbered in the order of their length 4 being longest.

EDITORIAL NOTES.

PROF. C. E. BESSEY, with his family, is spending the winter in the east. Another botanical text-book will doubtless be the product of his freedom from class-work.

ILLINOIS INDUSTRIAL UNIVERSITY has quite a well organized Natural History Society. The programme for 1883, just received, shows one meeting, that of April 7, devoted to a botanical topic, viz: "Notes on Mosses," by Mr. A. B. Seymour.

E. RAY LANKESTER upholds in a vigorous article in *Nature* the view formerly fully presented by him in a memoir in the *Quart. Jour. Micros. Sci.* that the Chlorophyll corpuscles of Hydra are truly Chlorophyll corpuscles and not Unicellular Algæ.

MR. A. H. CURTISS is now at work preparing his sixth fascicle of Florida plants, to be issued in February, which he expects to be more valuable than any of the preceding ones, and will contain very nearly all the South Florida plants which he has not previously distributed.

HENRY JOHN ELWES has published in London a most elaborate monograph of the genus *Lilium*, bearing the date of 1880. It is an Elephant folio and is one of those sumptuous volumes which are more apt to be published across the sea than here. Every species known to the author is figured, in natural size and colors, making 48 full-page plates.

WE WERE GUILTY of a little injustice in the December GAZETTE in speaking of Mr. Frank Bush's "Flora of Jackson Co., Mo.," when we wrote that the name of the state only appeared in the imprint. As

we said, it does not appear upon the title page, nor in the introduction, but we find that it is prominent enough at the top of every page of the text.

DR. BERGMAN concludes from his researches that formic and acetic acids are found in all parts of plants as constituents of the protoplasm and are to be regarded mainly as decomposition products, resulting continually from metastatic changes. An increase in the amount of these acids takes place whenever light is withdrawn unless the temperature is lowered at the same time to the minimum required for growth.

DR. FRED. BRENDEL of Peoria, Illinois, has just published a treatise upon the topography, climate and vegetation of Illinois, which also contains a Catalogue of the Flora around Peoria. This is an imperial octavo of 107 pages, but as it is in German, and printed at Buda-Pesth, and is a part of the fifth volume of the *Termeszetrajzi Fusetek* (whatever that may be), American botanists will not be apt to get much good of it.

IN THIS NUMBER of the GAZETTE is begun a series of short biographical sketches of some North American botanists of the first half of the century. Many botanists, who have not access to large libraries, feel an interest in knowing more about those whose abbreviated names are of such familiar occurrence in our manuals and a wider knowledge of the history of botany and the personality of botanists will help us all.

MR. J. G. BAKER has prepared a paper on the flora of Madagascar, recently read before the Linnean Society. It contains descriptions of 140 new species of *Polypetalæ*. Some of the genera are widely diffused throughout the tropics; others are of temperate types; others are characteristic of the Cape flora; and a new genus is allied to the American *Hiræa*; and some characteristic Australian genera are present by their representatives.

A. ERNST writes to *Nature* from Caracas about an abnormal fruit of *Opuntia Ficus-Indica*, which had developed wholly inclosed in one of the flat branches. He also inclined to believe that what is taken to be the pericarp of the *Opuntia* fruit is nothing but a slightly modified branch, bearing the ovary of the flower in a cavity on its upper end. If this is true *Opuntia* can no longer be described as having an "exerted ovary," as the latter is sunk in the interior of a branch.

IT HAS BEEN recorded by Dr. Brandis, Director of the India Forest Department, that *Acacia dealbata* introduced into India from Australia in 1845 has gradually changed its time of flowering from October, the Australian spring, to June, the corresponding spring month in India. In 1850 the tree flowered in October, in 1860 in September, in 1870 in August, 1878 in July and in 1882 in June. Mr. Dyer notices this fact in *Nature* and adds the statement that *Acacia decurrens*, var. *mollis*, a close-

ly allied species and one observed by Sir Joseph Hooker to flower in Tasmania at the same time as *A. dealbata*, has during its cultivation in England since 1790 changed its time of flowering from May–July to February. The influence of their environment upon the blossoming of these trees seems quite marked.

M. LEPLAY of the Paris Academy of Sciences has read a paper upon a chemical study on maize. He states that sugar is found in the leaves, and accumulates in the stem till the moment of formation of starch in the grains. It then migrates into the spike, first into the support of the grains, then into the grains themselves, where it is replaced by starch. This migration continues to be fed by the leaves till they disappear, then in great part by the stem, diminishing, however, as the starch is developed. The function of the sugar, then, is to furnish to the grain the elements of starch.

MR. WM. M. CANBY has observed that the tips of the leaflets of *Akebia quinata*, a plant twining over a trellis near his porch, dripped moisture enough to make the floor look as if sprinkled. Mr. Meehan has followed up these observations and found no constancy nor periodicity in the exudation, nor, indeed any external circumstances which induce it. The same observer detected a similar exudation from the pistil just before the expansion of the flower and also among the petals in the bud which soon disappeared. In *Thuja* also there is a sudden appearance of a small globule at the open mouth of the naked ovule. Sachs suggests that in Coniferæ the use of this exudation is to catch the pollen and as it sinks within the vesicle carries the pollen grains to the nucleus and fertilization is effected by actual contact.

WE ARE SURE that the friends of the GAZETTE will be gratified at the evidence of progress shown by this initial number of Vol. VIII. The new arrangement of matter into distinct departments, with some additional pages and a greater range in type, nearly doubles the capacity, and in our opinion we now present to our patrons as large and neatly printed a periodical as can be issued at the present low rate of subscription. The editor also takes pleasure in announcing in this formal way, what all have seen upon the title page, that with the new volume there will be associated with him Professor Charles R. Barnes, of Purdue University, and Prof. J. C. Arthur, of Charles City, Iowa. All who are acquainted with these gentlemen will testify to the fact that no better selection could have been made, and that their vigor of thought and action will constantly be felt in the pages of the GAZETTE.

DR. A. L. CHILD records in the *Popular Science Monthly* some observations upon the relation between the so-called "annual rings" of trees and the known age. His attention was called to the matter by the statement of M. Desirę Charnay that in a shrub which he knew to be on-

ly eighteen months old he counted eighteen rings of growth. In 1871 Dr. Child planted some seeds of *Acer rubrum*. In transplanting in 1873 the trees were set too close and had to be thinned. In each of four of these trees when they were cut down in 1882 he counted from 35 to 40 separate rings. In three of them twelve rings were plainer than the rest, while in the fourth, nine were large and the remainder not distinguishable from each other. All of these saplings were of known age. Certainly if 35 or 40 rings may be made in twelve years, the estimates of age based on the number of growth rings cannot be very accurate. The rings varied in thickness from 2½ to 28 mm.

DR. CHAS. MOHR has been looking up the rare *Rhus cotinoides*, Nutt., for the Tenth Census. It has been lost to the botanical world for forty years and was poorly understood. After considerable search the tree was found where Prof. Buckley had found it in 1841. Its habitat seems to be upon the southern declivities of mountains along the valley of the Tennessee in Alabama and probably extending northward into the State of Tennessee. Dr. Mohr reports it as yielding a yellow dyestuff and formerly much used for that purpose in the neighboring settlements. On account of the great beauty of its wood the tree is called by the negroes Shittim-wood, they believing that it is the very wood so named in the Bible. "The wood permits of the finest finish; the fineness of its grain, beauty of color and its hardness fit it well for inlaid work, veneering, and the manufacture of smaller articles of all kinds of fancy woodwork." An interesting account of this re-discovery is given in Proc. Philad. Acad., p. 217, 1882.

CURRENT LITERATURE.

Descriptions of New Species of Fungi, collected in the vicinity of Cincinnati. By THOMAS G. LEA, and described by REV. M. J. BERKELEY. Republished from "A Catalogue of the Plants of Cincinnati, by Thomas G. Lea."—This important pamphlet has just been published by the Cincinnati Society of Natural History. Thos. G. Lea's "Catalogue of Plants" was published in 1849, the collections having been made during the years 1834–44, but it has become so exceedingly rare as to be virtually inaccessible to students. This was to be regretted principally on account of its containing a list of Fungi with notes and descriptions of the new species by the eminent English mycologist, Rev. M. J. Berkeley. This loss has now been generously made good by the Society referred to, and this neat pamphlet of 21 pages is hailed with delight by more than the local mycologists. The richness of Mr. Lea's collections may be inferred from the fact that out of a list of 80 species 51 are new, and one of them was made the type of a new genus, *Psilopezia* by name. The Cincinnati Society of Natural History has quite an enterprising set of members, who are well cultivating many departments, not even neglecting, as is seen, this much neglected branch of Systematic Botany, and they promise to publish during this present year a synopsis of Hymenomycetes of the Miami Valley, by Prof. A. P. Morgan.